

# 2SK3927-01L,S,SJ



## N-CHANNEL SILICON POWER MOSFET

■ Outline Drawings (mm) 200406

### FUJI POWER MOSFET Super FAP-G Series

#### ■ Features

High speed switching      Low on-resistance  
No secondary breakdown      Low driving power  
Avalanche-proof

#### ■ Applications

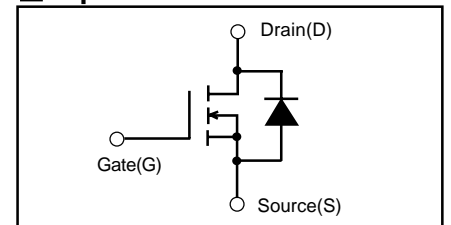
Switching regulators      DC-DC converters  
UPS (Uninterruptible Power Supply)

#### ■ Maximum ratings and characteristic

● Absolute maximum ratings  
(T<sub>c</sub>=25°C unless otherwise specified)

| Item                                    | Symbol               | Ratings     | Unit  | Remarks               |
|---|----------------------|-------------|-------|-----------------------|
| Drain-source voltage                    | V <sub>DS</sub>      | 250         | V     |                       |
|   | V <sub>D SX</sub>    | 220         | V     | V <sub>GS</sub> =-30V |
| Continuous Drain Current                | I <sub>D</sub>       | 34          | A     |                       |
| Pulsed Drain Current                    | I <sub>D(puls)</sub> | ±136        | A     |                       |
| Gate-Source Voltage                     | V <sub>GS</sub>      | ±30         | V     |                       |
| Maximum Avalanche current               | I <sub>AR</sub>      | 34          | A     | Note *1               |
| Non-Repetitive Maximum Avalanche Energy | E <sub>AS</sub>      | 665.7       | mJ    | Note *2               |
| Repetitive Maximum Avalanche Energy     | E <sub>AR</sub>      | 27          | mJ    | Note *3               |
| Maximum Drain-Source dV/dt              | dV <sub>DS</sub> /dt | 20          | kV/μs | V <sub>DS</sub> ≤250V |
| Peak Diode Recovery dV/dt               | dV/dt                | 5           | kV/μs | Note *4               |
| Peak Diode Recovery -di/dt              | -di/dt               | 100         | A/μs  | Note *5               |
| Max. Power Dissipation                  | P <sub>D</sub>       | 270         | W     | T <sub>c</sub> =25°C  |
|   |                      | 2.02        |       | T <sub>a</sub> =25°C  |
| Operating and Storage Temperature range | T <sub>ch</sub>      | +150        | °C    |                       |
|   | T <sub>stg</sub>     | -55 to +150 | °C    |                       |

#### ■ Equivalent circuit schematic



Note \*1: T<sub>ch</sub> ≤ 150°C, Repetitive and Non-repetitive

Note \*2: Starting T<sub>ch</sub>=25°C, I<sub>AS</sub>=14A, L=5.71mH,

V<sub>CC</sub>=48V, R<sub>G</sub>=50Ω

E<sub>AS</sub> limited by maximum channel temperature and Avalanche current.

See to the 'Avalanche Energy' graph

Note \*3: Repetitive rating: Pulse width limited by maximum channel temperature.

See to the 'Transient Thermal impedance' graph.

Note \*4: I<sub>F</sub> ≤ -I<sub>D</sub>, -di/dt=100A/μs, V<sub>CC</sub> ≤ BV<sub>DSS</sub>, T<sub>ch</sub> ≤ 150°C

Note \*5: I<sub>F</sub> ≤ -I<sub>D</sub>, dv/dt=5kV/μs, V<sub>CC</sub> ≤ BV<sub>DSS</sub>, T<sub>ch</sub> ≤ 150°C

#### ● Electrical characteristics (T<sub>c</sub> = 25°C unless otherwise specified)

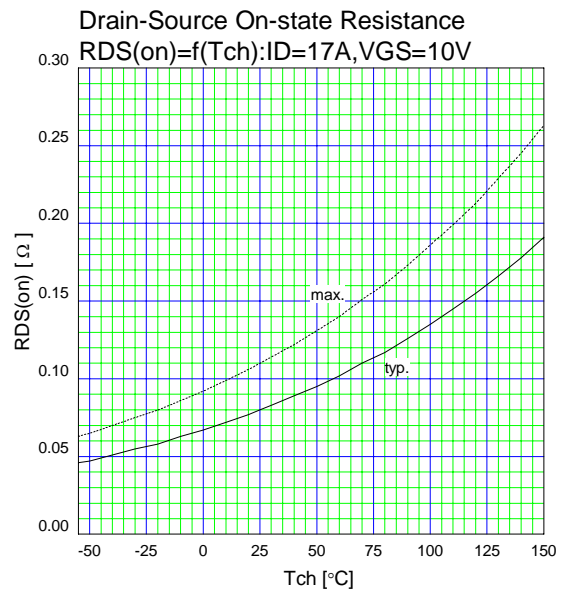
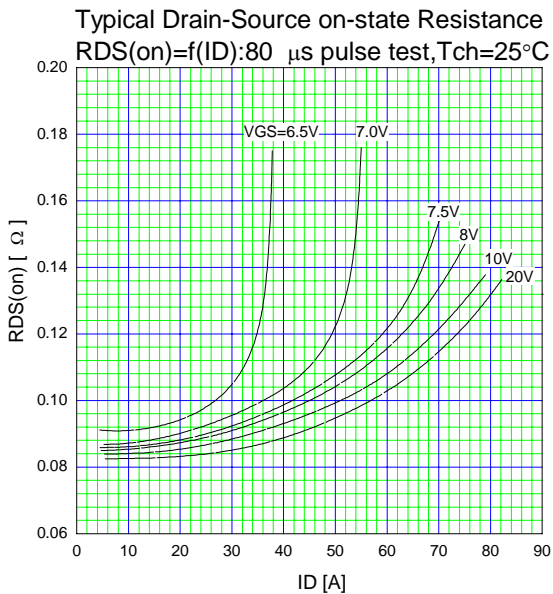
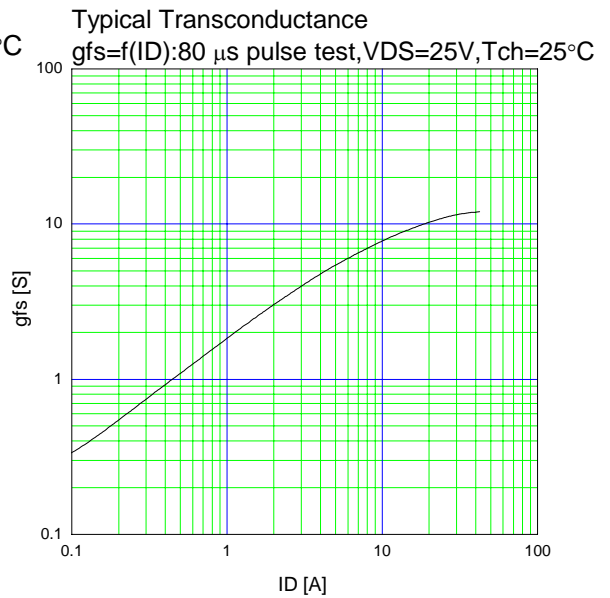
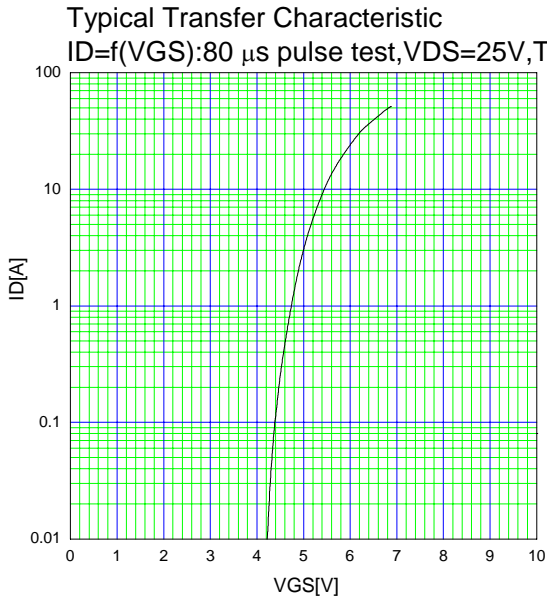
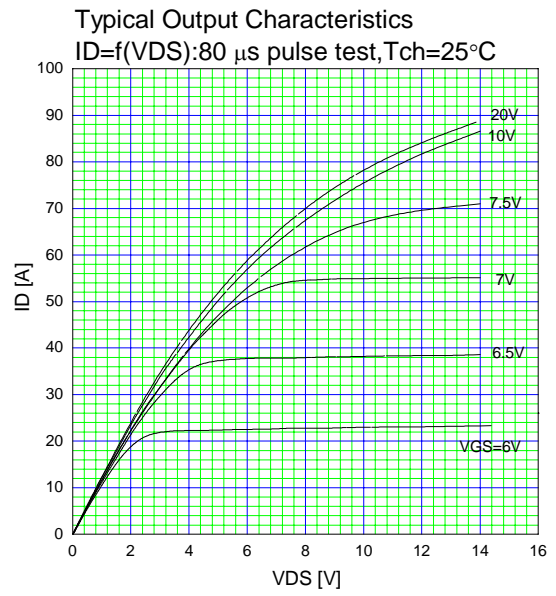
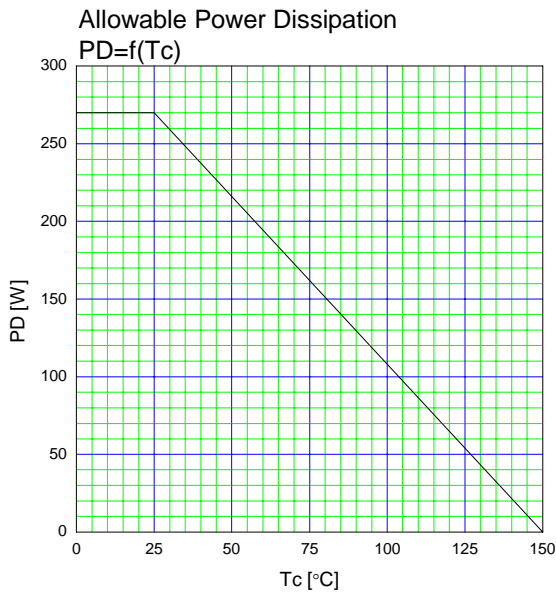
| Item                             | Symbol              | Test Conditions   | Min. | Typ. | Max. | Units |
|----------------------------------|---------------------|---|------|------|------|-------|
| Drain-Source Breakdown Voltage   | BV <sub>DSS</sub>   | I <sub>D</sub> = 250μA V <sub>GS</sub> =0V                    | 250  |      |      | V     |
| Gate Threshold Voltage           | V <sub>GS(th)</sub> | I <sub>D</sub> = 250μA V <sub>DS</sub> =V <sub>GS</sub>       | 3.0  |      | 5.0  | V     |
| Zero Gate Voltage Drain Current  | I <sub>DSS</sub>    | V <sub>DS</sub> =250V V <sub>GS</sub> =0V                     |      |      | 25   | μA    |
|                                  |                     | V <sub>DS</sub> =200V V <sub>GS</sub> =0V                     |      |      | 2.0  | mA    |
| Gate-Source Leakage Current      | I <sub>GSS</sub>    | V <sub>GS</sub> =±30V V <sub>DS</sub> =0V                     |      |      | 100  | nA    |
| Drain-Source On-State Resistance | R <sub>DS(on)</sub> | I <sub>D</sub> =17A V <sub>GS</sub> =10V                      |      | 85   | 110  | mΩ    |
| Forward Transconductance         | g <sub>fs</sub>     | I <sub>D</sub> =17A V <sub>DS</sub> =25V                      | 13   | 26   |      | S     |
| Input Capacitance                | C <sub>iss</sub>    | V <sub>DS</sub> =75V  |      | 1850 | 2800 | pF    |
| Output Capacitance               | C <sub>oss</sub>    | V <sub>GS</sub> =0V   |      | 220  | 330  |       |
| Reverse Transfer Capacitance     | C <sub>rss</sub>    | f=1MHz  |      | 21   | 32   |       |
| Turn-On Time t <sub>on</sub>     | t <sub>d(on)</sub>  | V <sub>CC</sub> =48V I <sub>D</sub> =17A                      |      | 20   | 30   | ns    |
|                                  | t <sub>r</sub>      | V <sub>GS</sub> =10V  |      | 19   | 29   |       |
| Turn-Off Time t <sub>off</sub>   | t <sub>d(off)</sub> | R <sub>GS</sub> =10Ω  |      | 56   | 85   |       |
|                                  | t <sub>f</sub>      |   |      | 19   | 29   |       |
| Total Gate Charge                | Q <sub>G</sub>      | V <sub>CC</sub> =125V   |      | 56   | 85   | nC    |
| Gate-Source Charge               | Q <sub>GS</sub>     | I <sub>D</sub> =34A   |      | 20   | 30   |       |
| Gate-Drain Charge                | Q <sub>GD</sub>     | V <sub>GS</sub> =10V  |      | 19   | 29   |       |
| Diode forward on-voltage         | V <sub>SD</sub>     | I <sub>F</sub> =34A V <sub>GS</sub> =0V T <sub>ch</sub> =25°C |      | 1.00 | 1.50 | V     |
| Reverse recovery time            | t <sub>rr</sub>     | I <sub>F</sub> =34A V <sub>GS</sub> =0V                       |      | 140  | 250  | ns    |
| Reverse recovery charge          | Q <sub>rr</sub>     | -di/dt=100A/μs T <sub>ch</sub> =25°C                          |      | 0.5  | 1.25 | μC    |

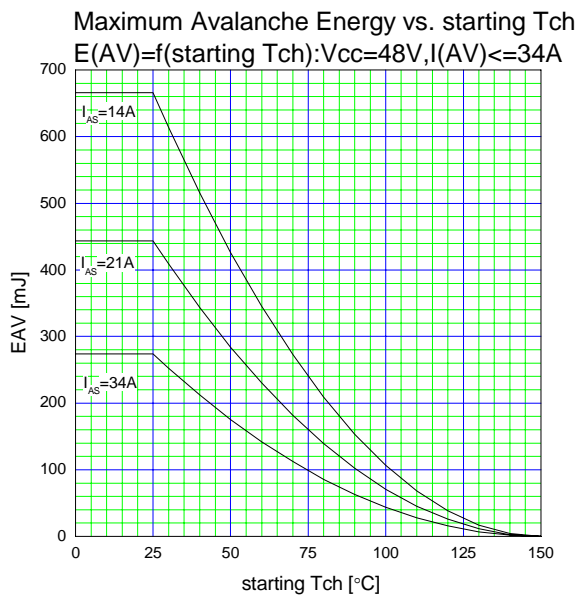
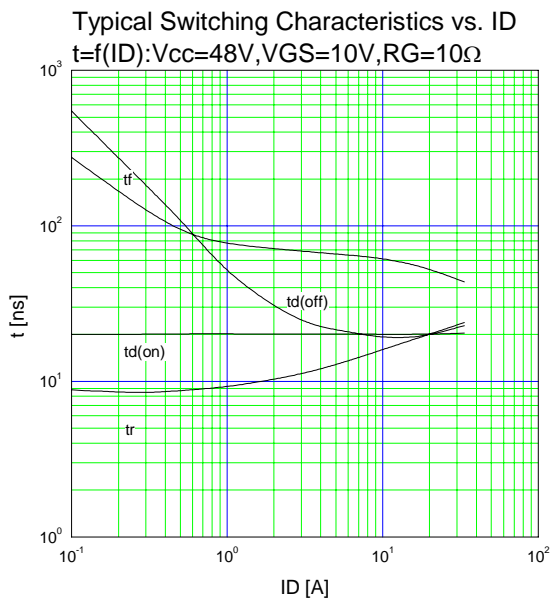
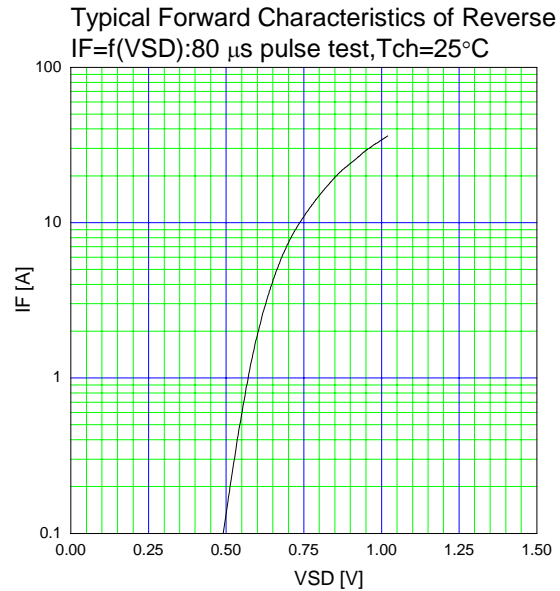
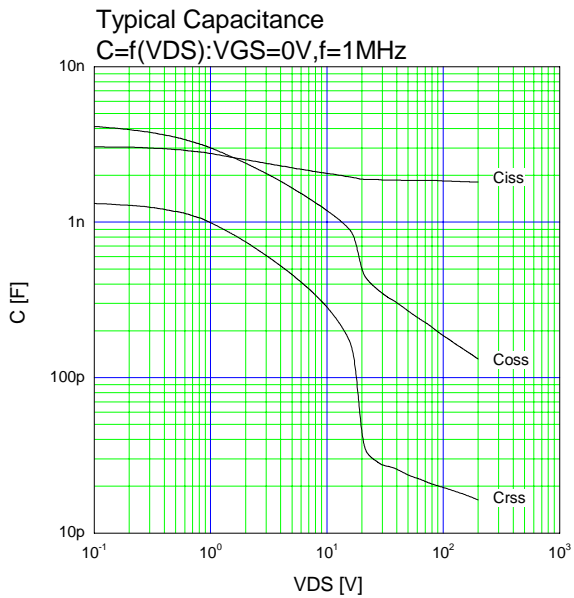
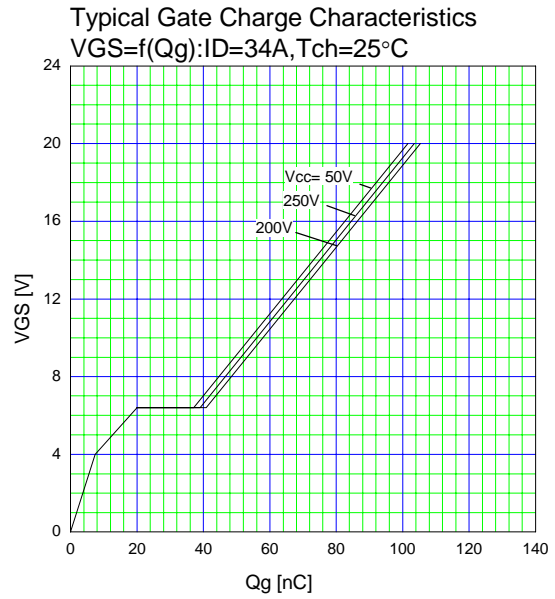
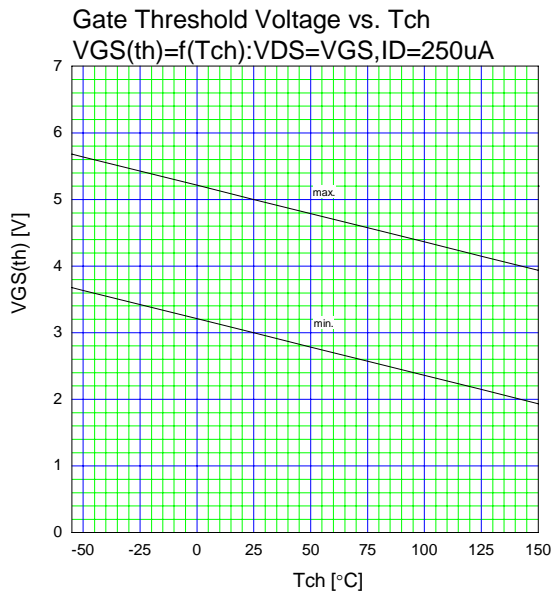
#### ● Thermal characteristics

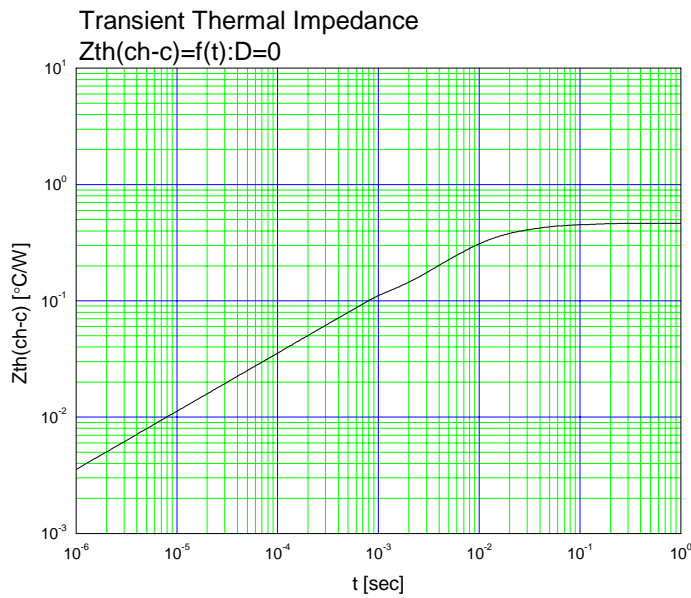
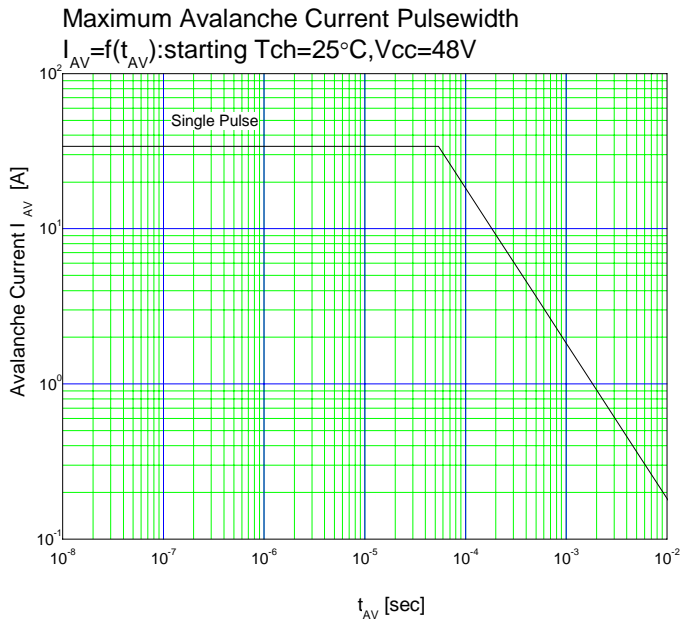
| Item               | Symbol                | Test Conditions    | Min. | Typ. | Max.  | Units |
|--------------------|-----------------------|--------------------|------|------|-------|-------|
| Thermal resistance | R <sub>th(ch-c)</sub> | channel to case    |      |      | 0.463 | °C/W  |
|                    | R <sub>th(ch-a)</sub> | channel to ambient |      |      | 75    | °C/W  |

See to P4

## Characteristics







## Outline Drawings (mm)

